

We claim:

Sub A

1. An extendable exterior rearview mirror assembly comprising:
a mounting bracket adapted for mounting to a vehicle;
a mirror subassembly having a housing and a reflective element;
a biasing member; and
5 a support arm mounted for pivotal movement on said mounting bracket from a normal operating position toward a folded position, said mirror subassembly being supported by said support arm and being mounted for selective movement along said arm to one of at least two viewing positions, said biasing member urging said support arm into frictional engagement with said mirror subassembly to limit movement of said mirror subassembly along said support arm, and said movement of said mirror subassembly along said support arm being independent from said pivotal movement.

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2. The extendable exterior rearview mirror assembly according to Claim 1, wherein said mirror subassembly further comprises an actuator, said actuator supporting said reflective element in said housing of said mirror subassembly and providing adjustment to the orientation of said reflective element about at least one axis.

Sub B

3. The extendable exterior rearview mirror assembly according to Claim 2, wherein said mirror subassembly further comprises an actuator bracket, said actuator bracket mounting said actuator in said housing of said mirror subassembly, said biasing member urging said support arm into frictional engagement with said actuator bracket to limit the movement of said mirror subassembly along said support arm.

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4. The extendable exterior rearview mirror assembly according to Claim 2, wherein said actuator comprises an electric actuator.

Sub C

5. The extendable exterior rearview mirror assembly according to Claim 1, wherein said biasing member comprises at least one plate spring, said plate spring having an undulating cross-section and urging said support arm into frictional engagement with said mirror subassembly, and said undulating cross-section absorbing manufacturing tolerances of said support arm and said mirror subassembly.

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6. The extendable exterior rearview mirror assembly according to Claim 5, wherein plate spring comprises a first plate spring, said biasing member including a second plate spring, said second plate spring having an undulating cross-section and together with said first plate spring urging said support arm into frictional engagement with said mirror subassembly.

7. The extendable exterior rearview mirror assembly according to Claim 3, wherein said actuator bracket includes a clamp, said clamp supporting said support arm against said biasing member.

8. The extendable exterior rearview mirror assembly according to Claim 7, wherein said actuator includes a body, said clamp comprising an L-shaped clamp, said L-shaped clamp and said body of said actuator bracket defining a longitudinal passage, said support arm extending in said longitudinal passage, and said biasing member urging said support arm into frictional engagement with said clamp.

9. The extendable exterior rearview mirror assembly according to Claim 8, wherein said biasing member comprises a plate spring having an undulating cross-section, said plate spring biasing said support arm into frictional engagement with said clamp.

10. The extendable exterior rearview mirror assembly according to Claim 8, wherein said clamp includes a metal bearing surface, said biasing member urging said support arm into frictional engagement with said metal bearing surface.

11. The extendable exterior rearview mirror assembly according to Claim 10, wherein said actuator bracket includes a metal insert between said support arm and said clamp, said metal insert providing said metal bearing surface, and said biasing member urging said support arm into frictional engagement with said metal insert.

12. The extendable exterior rearview mirror assembly according to Claim 1, further comprising a driver assembly, said driver assembly selectively moving said mirror subassembly along said support arm.

13. The extendable exterior rearview mirror assembly according to Claim 12, wherein said driver assembly includes a threaded rod extended through said support arm and

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mounted to said mirror subassembly, and a drive motor, said drive motor driving ~~to~~ said threaded rod and moving said mirror subassembly along said support arm.

14. The extendable exterior rearview mirror assembly according to Claim 13, wherein said driver assembly further includes a reduction gear, said reduction gear being mounted on said threaded rod, and said driver motor engaging said reduction gear for driving said mirror subassembly along said support.

15. The extendable exterior rearview mirror assembly according to Claim 13, wherein said threaded rod is fixably mounted to said mirror subassembly.

16. The extendable exterior rearview mirror assembly according to Claim 13, wherein said driver assembly further includes a clutch, said clutch drivingly decoupling said motor from said threaded rod to provide a manual override of said drive motor.

Sub 5
17. An extendable exterior rearview mirror assembly comprising:
a mounting bracket adapted for mounting to a vehicle;
a mirror subassembly having a housing, a reflective element, and an actuator supporting said reflective element in said housing, said actuator being mounted to said housing by an actuator bracket;
a biasing member; and
a support arm supported by said mounting bracket, said mirror subassembly being supported by said support arm and being mounted for selective movement along said support arm to at least one of two viewing positions, said biasing member urging said support arm into frictional engagement with said actuator bracket to limit movement of said mirror subassembly along said support arm.

18. The extendable exterior rearview mirror assembly according to Claim 17, wherein said actuator comprises an electrical actuator, said electrical actuator providing adjustment of said reflective element about at least one axis.

19. The extendable exterior rearview mirror assembly according to Claim 17, wherein said reflective element comprises a first reflective element, and said mirror subassembly

having a second reflective element, and one of said first and second reflective elements comprising a convex reflective element.

Sub 26
20. The extendable exterior rearview mirror assembly according to Claim 17, wherein said biasing member comprises a plate spring, said plate spring having an undulating cross-section and urging said support arm into frictional engagement with said actuator bracket while absorbing manufacturing tolerance of said actuator bracket and support arm.

21. The extendable exterior rearview mirror assembly according to Claim 20, wherein said actuator bracket includes a longitudinal passage, said support arm extending into said longitudinal passage and being urged into frictional engagement with said actuator bracket by said biasing member.

22. The extendable exterior rearview mirror assembly according to Claim 21, wherein said actuator bracket includes a clamp, said clamp frictionally holding said support arm in said longitudinal passage to limit the movement of said mirror subassembly along said support arm.

23. The extendable exterior rearview mirror assembly according to Claim 22, wherein said clamp comprises an L-shape member, said biasing member comprising a pair of wave springs, said clamp clamping said support arm against said wave springs such that said wave springs bias said support arm into frictional engagement with said clamp.

24. The extendable exterior rearview mirror assembly according to Claim 23, wherein said actuator bracket further includes a bearing member interposed between said clamp and said support arm, said bearing member having a smooth planar surface.

25. The extendable exterior rearview mirror assembly according to Claim 24, wherein said bearing member comprises a metal bearing member.

26. The extendable exterior rearview mirror assembly according to Claim 24, wherein said bearing member comprises a L-shaped member.

27. The extendable exterior rearview mirror assembly according to Claim 17, wherein said support arm is mounted for pivotal movement on said mounting bracket between a normal operating position and a folded position.

28. The extendable exterior rearview mirror assembly according to Claim 17, wherein said support arm includes a stop, said stop limiting movement of said mirror subassembly along said support arm.

29. The extendable exterior rearview mirror assembly according to Claim 17, further comprising a driver assembly, said driver assembly selectively moving said mirror subassembly along said support arm.

30. The extendable exterior rearview mirror assembly according to Claim 29, wherein said driver assembly includes a motor, said motor being supported by said support arm.

31. The extendable exterior rearview mirror assembly according to Claim 29, wherein said driver assembly includes a clutch, said clutch drivingly decoupling said driver assembly from said mirror subassembly whereby said mirror subassembly can be manually moved along said support arm.

32. An extendable exterior rearview mirror assembly comprising:
a mounting bracket adapted for mounting to a vehicle;
a mirror subassembly having a housing, a reflective element and an actuator supporting said reflective element in said housing, said actuator being mounted to said housing by an actuator bracket; and
a support arm supported by said mounting bracket, said mirror subassembly being supported by said support arm and being mounted for selective movement along said support arm to at least one of two viewing positions, said support arm frictionally engaging said actuator bracket thereby limiting movement of said mirror subassembly along said support arm.

33. The extendable exterior rearview mirror assembly according to Claim 32, wherein said actuator bracket included a transverse passage, and said support arm extending into said transverse passage to frictionally engage said actuator bracket.

34. The extendable exterior rearview mirror assembly according to Claim 33, wherein said actuator bracket includes a biasing member in said passage for urging said support arm into frictional engagement with said actuator bracket.

35. The extendable exterior rearview mirror assembly according to Claim 34, wherein said biasing member comprises a wave spring, said spring extending through said passage for urging said support arm into frictional engagement with said actuator bracket.

36. The extendable exterior rearview mirror assembly according to Claim 35, wherein said actuator bracket further includes a clamp, said clamp urging said support arm against said wave spring.

37. The extendable exterior rearview mirror assembly according to Claim 32, wherein said support arm comprises a hollow support arm, said hollow support arm being reinforced by a plurality of webs.

38. The extendable exterior rearview mirror assembly according to Claim 37, wherein said webs include a plurality of openings, said openings being aligned to form at least one transverse passage through said support arm, said transverse passage through said support arm providing a wire routing for electrical devices in said mirror subassembly.

39. The extendable exterior rearview mirror assembly according to Claim 32, wherein said actuator comprises an electric actuator, said electric actuator providing adjustment of said reflective element about at least one axis.

40. The extendable exterior rearview mirror assembly according to Claim 32, wherein said reflective element comprises a first reflective element, said mirror subassembly having a second reflective element, and at least one of said first and second reflective elements comprising a convex reflective element to provide a spotting mirror.

41. The extendable exterior rearview mirror assembly according to Claim 32, wherein said reflective element comprises a variable electro-optic element.

42. The extendable exterior rearview mirror assembly according to Claim 32, wherein said actuator bracket comprises a plastic actuator bracket.

43. The extendable exterior rearview mirror assembly according to Claim 41, wherein said first and second reflective elements are supported on a reflective element holder, said actuator supporting said reflective element holder and said first and second reflective elements in said mirror subassembly.

44. The extendable exterior rearview mirror assembly according to Claim 32, wherein said mounting bracket includes a pair of mounting flanges, said support arm being mounted between said mounting flanges by a pivot bushing, and said pivot bushing being journaled in both said upper and lower mounting flanges to thereby improve the vibration characteristics of said extendable exterior rearview mirror assembly.

45. An extendable exterior rearview mirror assembly comprising:
a mounting bracket adapted for mounting to a vehicle;
a mirror subassembly having a housing and a reflective element;
a mono support arm mounted on said mounting bracket; and
a biasing member, said mirror subassembly further having a passage, said support arm extending into said passage and supporting said mirror subassembly thereon, said support arm being mounted for selective movement through said passage whereby said mirror subassembly moves along said support arm to one of at least two viewing positions, said biasing member urging said support arm into frictional engagement with said mirror subassembly to limit movement of said mirror subassembly along said support arm.

46. The extendable exterior rearview mirror assembly according to Claim 45, wherein said mirror subassembly includes an actuator and an actuator support for mounting said actuator in said housing, said reflective element being mounted to said actuator, and said actuator providing adjustment of the position of said reflective element in said housing.

47. The extendable exterior rearview mirror assembly according to Claim 46, wherein said actuator bracket includes said passage, said biasing member urging said support arm into frictional engagement with said actuator bracket to limit movement of said mirror subassembly along said support arm.

48. The extendable exterior rearview mirror assembly according to Claim 47, wherein said biasing member comprises a plate spring having an undulating cross-section, said undulating cross-section absorbing manufacturing tolerances of said support arm and said actuator bracket.

49. The extendable exterior rearview mirror assembly according to Claim 48, wherein said actuator comprises an electric actuator.

50. The extendable exterior rearview mirror assembly according to Claim 45, wherein said mono support arm is mounted for pivotal movement on said mounting bracket from a normal operating position toward a folded position.

51. The extendable exterior rearview mirror assembly according to Claim 50, wherein said movement of said mirror subassembly along said support arm is independent from said pivotal movement of said support arm about said mounting bracket.